

Occupational Health at a University

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OCCUPATIONAL HEALTH programs of official agencies have rather consistently overlooked the college as an area where preventive occupational health work could be profitably carried on.

There may be several reasons for this. Perhaps one is that these agencies have been so industry-oriented that they have overlooked the academic staff, other employees, and students of the larger colleges and universities as industrial or occupational groups with which to work. Another reason could well be the prevailing misconception that chemists, physicists, bacteriologists, engineers, and other similar professionally trained people know the potential health hazards of the materials and processes they use. The assumption follows that they also take the necessary precautions to protect themselves.

I can assure you, after working for several years with such professionally skilled personnel, this is definitely not so. Some well-informed persons are outstanding in the real concern they show for their own health and safety as well as that of their colleagues and assistants. But most have not sought information about possible health hazards in their work. I must add, however, that I have found academicians without exception to be a most receptive and interested group ready to accept the

facts and willing to cooperate in instituting corrective measures.

Even though our sights are gradually lifting from the strictly industrial to the broader concept of occupational health, the colleges and universities are still being overlooked. Generally, the administrative heads of colleges and universities fail to recognize that the campuses have occupational health hazards and often dangerous situations.

Sponsored research, both basic and applied, is now a multimillion dollar business for colleges and universities, vastly increasing research activities and staffs. At present many scientists are employed solely for research. They have no teaching responsibilities even though they are members of the academic staff. Their laboratories are no different from those in the research department of a large industry.

Campus Health Hazards

A large university campus has all the health hazards of industry and frequently some which have not yet reached the industrial stage. The latter hazards are the most troublesome to the occupational health engineer on the campus. Many times he can make only a wild guess as to the toxic properties of the materials being used, and in such cases he is inclined to be very conservative. At the same time he must not be so stringent in his control measures that it becomes virtually impossible to carry out the research project. To date, such problems at the University of Minnesota predominantly have concerned new agricultural chemicals and the resistance of various materials to chemical action at high temperatures and pressures.

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Some idea of the variety and types of occupational health hazards on a college or university campus is indicated by this partial list of those that have occurred at the University of Minnesota in recent years:

- The sergeant in charge of the armory rifle range became ill with lead poisoning. Air sampling revealed atmospheric lead concentrations many times the maximum allowable concentration although only a portion of the range was used. Installation of an extensive ventilating system corrected this hazard.

- Scientists working on particle-size measurement were being overexposed to benzol in a filter cleaning operation. The use of local exhaust ventilation eliminated this hazard.

- Lead and solvent hazards have been studied in the print shop.

- The dangers of welding fumes have been eliminated from the maintenance shops.

- The carbon monoxide content of the air in the university's underground garages has been measured during periods of heavy usage.

- Excessive noise in wind tunnel, in jet engine testing, and in jet fuel combustion research has been evaluated.

- The mercury hazard has been studied in scores of laboratories.

- The misuse of carbon tetrachloride is campuswide and is being studied.

- Potential dangers in handling organic, phosphate-type insecticides in laboratory, greenhouse, and field have been studied.

In most of these problems only a few persons were exposed, which may be somewhat different from the industrial situation. Seldom are exposures to students great enough to cause actual poisoning or impairment of health, but control measures are instituted to alert students to potential hazards and to teach them what control measures are necessary in industry.

Although several institutions have teaching programs in occupational health, so far as I know, only the University of California, the Massachusetts Institute of Technology, and the University of Minnesota have operating functions in this field. Each of these three has a slightly different administrative pattern, undoubtedly dictated by the local situation. Colleges teaching occupational health may give

some service within their institutions when called upon, but in general they have no specific responsibility for the control of occupational disease hazards on their campuses.

University Health Service

The University of Minnesota is an autonomous branch of the State government, and all matters of health on its various campuses are a responsibility of the university health service. The Minnesota State Board of Health has therefore officially designated the university health service as a local health department; it is an independent service administratively under the academic vice-president.

The service's division of environmental health and safety was created to cope with the health aspects of water supply, waste disposal, food handling, student housing, swimming pools, radiological health, safety, and occupational hazards. On the staff of the division full time are 1 public health engineer, 1 occupational health engineer, 1 safety engineer, 3 health physicists, and 2 sanitarians, and part time, 2 engineers and a sanitarian. The full-time staff members also have academic appointments in the School of Public Health. This staff may seem large, but considering the size and geographic spread of the institution, it may be too small.

For a program with a wide scope of activities, it is highly desirable to have one or more physicians either on the occupational health staff or closely associated with it. At the University of Minnesota one of the health service physicians is assigned to give special attention to occupational diseases and to medical problems associated with exposure to ionizing radiation.

The University of Minnesota has the second largest enrollment of full-time students in the country, exceeded only by the University of California. In the fall of 1957 about 35,000 students were enrolled on the Minneapolis, St. Paul, and Duluth campuses and an estimated 90,000 a year in all forms of instruction—day, night, and extension classes and correspondence courses. To serve the student body the university employs about 10,000 people, 3,500 of these full-time academic staff members.

The bulk of the instruction is carried out on the three campuses. There are also 5 agricultural experimental stations and schools in outlying parts of the State; an 8,000-acre center for all types of research 25 miles south of the Minneapolis campus; a 2,000-acre wildlife preserve 25 miles north of the St. Paul campus for research on wildlife, forests, lakes, and streams; and a number of smaller stations and research facilities.

Three factors of the division's administrative arrangement we feel are highly desirable. First, the occupational health engineer is a part of a professional team. Close association with the radiological health and safety personnel is particularly helpful to him because occupational health problems frequently involve these fields. Occupational health and safety are very closely allied; in fact, it is often difficult to distinguish between them. Having specialists in both these fields on the same team rather than in different departments, where overlapping activities and contradictory recommendations might occur, is especially advantageous.

For example, the safety engineer was asked to consider the safety hazards of using solvents in a cryostat, a refrigerated, box-like apparatus employed to carry out laboratory procedures at extremely low temperatures. The operator uses insulated gloves mounted in the wall of the apparatus. Neither the motor-driven fan nor the electric lights inside it are explosion proof. From a safety standpoint, it would be hazardous to use solvents in this cabinet unless the temperature is maintained at all times below the flashpoint of the solvent. From an occupational health standpoint, the cryostat is a good device since the hazardous operation is fully enclosed.

The safety engineer is inclined to recommend that this work be done in a large walk-in freezer where it would be virtually impossible to create an explosive mixture. The occupational health engineer is inclined to veto this recommendation because of the dangers of inhaling solvents in a confined, unventilated space.

In this case, the conflicting interests were worked out by agreeing not to use solvents with combustible vapors in cryostats and by providing adequate ventilation in the walk-in freezers. If these two engineers had been in

different departments, such a compromise might have been made only after some misunderstanding and delay. In our case the conflict was resolved in minutes.

A second strong feature of the administrative plan is the academic appointments with teaching responsibilities of our staff members. Teaching occupational health forces us to be aware of all new developments, and working in an operating program provides us with a wealth of illustrations, examples, and demonstrations to use in the classroom.

The third feature is the division's close association with the medical staff of the health service which serves the staff and students. The medical staff members are alert to possible environmental factors of illnesses that come to their attention. For example, a student with severe headaches came to a staff physician. After detailed questioning, the physician was satisfied that the headaches were associated with the home environment. The occupational health engineer found 400 ppm carbon monoxide in the flue gases being discharged into the student's apartment by a gas refrigerator.

Several mercury and solvent hazard studies have been initiated at the request of physicians who have suspected such poisoning in students and laboratory workers seeking medical attention. The results of a survey of occupational health hazards on the campus have enabled the industrial health engineer and the physicians to advise the university's civil service department on the proper placement of a maintenance worker who suffers from certain specific allergies. Such requests for assistance and referral of problems would not be as frequent if the occupational health engineer and the physician were not in the same department.

A university occupational health program has all the usual elements of prevention, including preplacement and periodic physical examinations, evaluations of possible occupational health hazards, and recommendations for the corrections needed.

Survey of Hazards

One of its most profitable phases is a room-by-room survey of the entire campus for occupational health hazards. The broad activ-

ities of the division of environmental health and safety mean we survey much more than the usual hazards. We include the following areas:

Fire and accident prevention. Adequate provision of gas masks, protective clothing, fire blankets, safety showers, illumination, first aid kits, and fire extinguishers.

General sanitation. Availability of eating accommodations and building incinerators, insect and rodent control, plumbing defects, and refuse disposal.

Animal care. Types of animals used, source of supply, isolation procedures, evidence of ectoparasites, cage cleaning methods, type of bedding, and disposal of solid wastes and dead animals.

Radiation hazards. X-ray machines, sealed or unsealed radionuclides, and other sources of ionizing radiation.

Building safety. Adequate exits, handrails, and stairways; guarding of machinery; grounding of electrical equipment; and the handling, storage, and disposal of flammable solvents.

The survey provides an unusual opportunity for the occupational health engineer to get acquainted with the institution and for the various branches of the university to become familiar with this health service function.

The occupational health engineer also reviews all plans for new buildings and major remodeling of older buildings at the university. At present, 48 such projects are in various stages of planning and building. These pro-

vide him with an unusual opportunity to recommend the proper ventilation to protect the health and welfare of the occupants, to review the need for process or special ventilation, hoods, safety showers, and fire extinguishers, and to check for adequate means of egress. The occupational health engineer also serves as consultant to the space allocations committee of the university, advising on health and safety considerations in the assignment of building space for various shops and research projects.

If it is to serve to its fullest capacity, a university occupational health program must be concerned with problems beyond those considered strictly health matters such as fire prevention and disposal of solid and liquid wastes which are combustible or toxic or both. The occupational health staff does not necessarily have to operate such programs, but should have an intimate working relationship with the persons responsible.

In other institutions where environmental health is not interpreted as broadly as at the University of Minnesota, to establish close-working relationships between the occupational health personnel and those responsible for other environmental problems would be highly advantageous. I urge those of you in the occupational health programs of government agencies to visit the colleges and universities in your area and offer to survey their facilities for occupational health hazards. You will find that you can assist them with a number of problems and you may find that they can help you with some of yours.